Periomat Plus

EN

Installation and Operating Instructions

CE

9000-600-11/30

DÜRR DENTAL

2010/08

Content

Important Information

1. Warnings and Symbols 4
2. General 5
2.1 Note on Conformity 5
2.2 General Notes 5
2.3 Disposal 5
2.4 Notes on medical products 5
2.5 Notes on EMC and medical products 6
2.6 Correct Usage 6
2.7 Incorrect usage 6
2.8 Connecting peripheral appliances . . . 6
3. Safety 6
3.1 General Safety Notes 6
3.2 Electrical safety instructions 6
4. Delivery Contents 9
4.1 Special accessories 9
4.2 Disposable materials 9
5. Technical Data 10
5.1 Model Overview 10
5.2 Model identification plate 10
5.3 Ambient conditions 11
6. Switch panel functions 11

Mounting

7. Set-up 12
7.1 Room for Set-up 12
7.2 Set-up 12
8. Start-up 12
8.1 Prepare the appliance 12
9. Circuit diagram 16
9.1 Descriptions 17
9.2 Connection colours 17

Use

10. Chemical preparation 18
11. Instructions for use 19
11.1 Film insertion without adapter 19
11.2 Film insertion with adapter 21
11.3 Miscellaneous 24
12. Maintenance 25
12.1 Weekly 2 x water change and check level of chemicals. 25
12.2 Every 3 weeks change chemicals . 27
12.3 Every 6 months clean the film transport 28

EN

Important Information

1. Warnings and Symbols

Warnings

The warning notes in this document are designed to point out possible hazards which could cause either injury to staff or damage to the appliance.

EN

They are marked using the following warning symbols:

General warning symbols

Warning - dangerous electrical voltage

Danger to health

The safety instructions are laid out in the following way:

SIGNAL WORD
Description of type and cause of hazard
Description of possible outcomes if safety notes are ignored
- Observe these measures to prevent any possible danger occuring.

The safety instructions are graded in four levels of danger:

DANGER	Extremely hazardous and could lead to serious injury or death
WARNING	Possibly hazardous but could lead to serious injury or death
CAREFUL	Could lead to minor injury
ATTENTION	Could lead to serious damage

Further symbols used

These symbols are used in this documentation and /or on the appliance:

Notes, e.g. special instructions concerning efficient usage of the appliance.

Unplug at the mains and remove all power.

Observe the instruction documentation supplied

Date of manufacture

Dispose of this appliance correctly according to EU directive (2002/96/EG-WEE).

Handling instructions

Handling instructions are marked with a dot:

- Execute this handling step.

2. General

2.1 Note on Conformity

This product has been tested for conformity according to the appropriate directives as laid down by the European Union and has been found to conform to all the required specifications.

2.2 General Notes

- These Installation and Operating Instructions form an integral part of the unit. They must be kept close to the unit at all times. Precise observance of these instructions is a precondition for use of the unit for the intended purpose and for its correct operation.
  New personnel must be made aware of the contents, and they should be passed on to future operating staff.
- Safety for the operator as well as trouble-free operation of the unit are only ensured if use is made of original equipment parts. Additionally, only parts specifically referred to in these Installation and Operating Instructions or accessories and disposable materials specifically recommended by Dürr Dental may be used. If other accessories or disposable materials are used with this appliance, Dürr Dental cannot guarantee safe operation or proper functioning. No liability on the part of the manufacturer will be accepted in the case that damage arises through the use of non-approved accessories.
- Dürr Dental are only responsible for the equipment with regard to safety, reliability and proper functioning where assembly, resettings, changes or modifications, extensions and repairs have been carried out by Dürr Dental or an agency authorized by Dürr Dental and if the equipment is used in conformity with the Installation and Operating Instructions.
- These Installation and Operating Instructions conform to the relevant version of the equipment and the underlying safety standards valid at the time of going to press. All circuits, processes, names, software and appliances quoted are protected under industrial property rights.
- The translation of these Installation and Operating Instructions has been carried out in good faith. No liability can be accepted for mistakes in the translation. The enclosed German version of these Installation and Operating Instructions is the reference version. If there is any doubt about the translation please consult your dealer.
- Any reprinting of the technical documentation, in whole or in part, is subject to prior approval of Dürr Dental being given in writing.
- Retain the packaging for possible return of the product to the manufacturers. Only the original packaging provides adequate protection during transport of the unit.
  Should return of the product to the manufacturers be necessary during the guarantee period, Dürr Dental accepts no responsibility for damage occurring during transport where the original packaging was not used!
  Ensure that the packaging is kept out of the reach of children.

2.3 Disposal

2.3.1 Appliance

- EU directive 2002/96/EG - WEEE (Waste Electric and Electronic Equipment) of 27th January 2003 and its current implementation state that under national law Dental Products are covered by the said directive and therefore, within the European Union, must be disposed of as special waste.
- If you have any questions at all concerning the proper disposal of this product, please contact either Dürr Dental directly or your usual specialist dental trader.

2.3.1 X-ray chemicals

Observe any local or national rules and regulations concerning disposal of x-ray chemicals.

2.4 Notes on medical products

- This product is a technical medical appliance and, as such, may only be operated by such persons who, as a result of training or experience, can be confidently expected to operate it correctly and safely for patients and staff alike.
- Do not lie multi-socket units on the floor. When using portable multiple socket-outlets then the requirements as laid out under EN 60601-1-1 must be observed.
- Other systems should not be plugged into the same multi-socket unit.

2.5 Notes on EMC and medical products

Medical products should be treated with respect when it comes to electro-magnetic compatibility and special safety measures must be taken. Special instructions concerning electro-magnetic compatibility for medical products can be found in our special leaflet, order number 9000-606-67/30, or the information can be found on the internet (www.duerr.de) in the Technical Documentation download pages.

EN

2.6 Correct Usage

The Periomat Plus is designed for the development of intraoral X-ray films of sizes 2 x 3 cm to 5.7 x 7.6 cm.

2.7 Incorrect usage

Any use of this appliance/these appliances above and beyond that laid down in the Installation and Operating Instructions is deemed to be incorrect usage. The manufacturer cannot be held liable for any damage resulting from incorrect usage. The operator will be held liable and bears all risks.

2.8 Connecting peripheral appliances

Appliances may only be connected together or connected to any other assemblies where complete and utter safety of the patients, operators and staff and of the environment will not be affected in any way.
Where any doubts remain concerning the safety when connecting to other units then the operator is obliged to ascertain that such connection can in no way affect the safety of operator, patient or other staff by referring to the manufacturer or a fully qualified and competent expert.

3. Safety

3.1 General Safety Notes

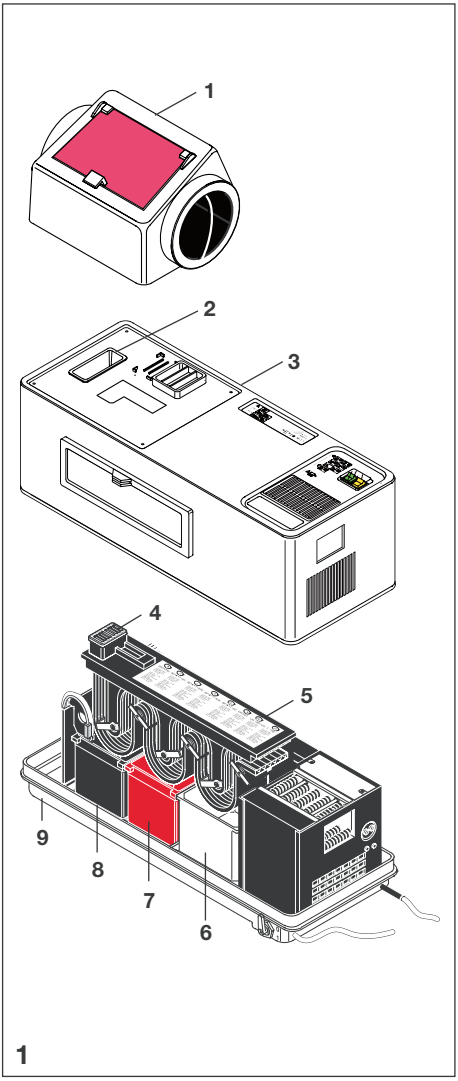
This appliance has been so designed and developed by Dürr Dental that under correct usage that there can be no danger to operator or patient. In spite of this, we feel it is our duty to mention the following safety measures in order to prevent any possible danger.

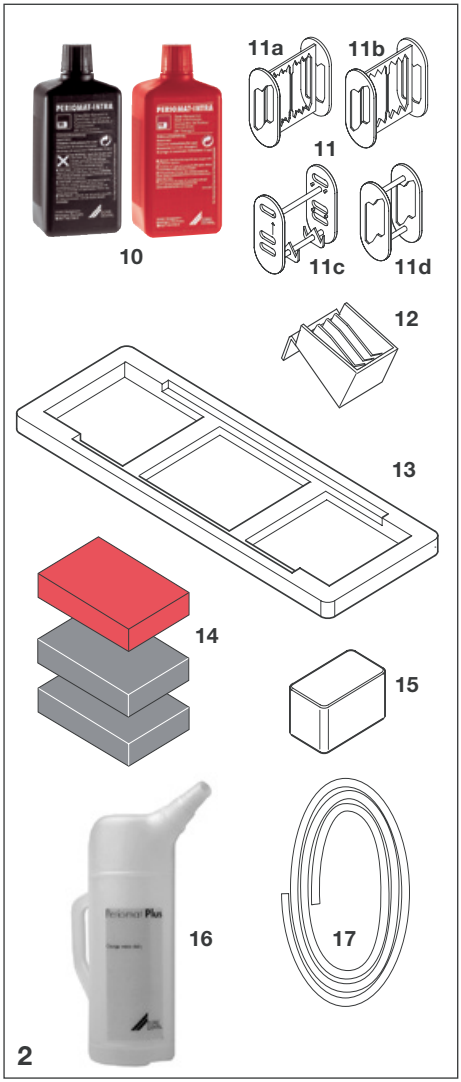
- When using this appliance all local and relevant regulations must be observed! Converting or modifying the appliance in any way is strictly prohibited. In such cases, any and all guarantees immediately become invalid. The operation of modified appliances can be punishable by law. In the interests of trouble-free operation the operator is responsible for observing these regulations.
- Installation must be carried out by a technical expert.
- Before every use the operator must check the functional safety and the condition of the appliance.
- The operator must be knowledgeable in the operation of the appliance.
- The product is not designed to be used in medical treatment areas where there exists the danger of explosion. Areas where explosions could occur are those where flammable anesthetic material, skin cleansers, oxygen and skin disinfectants are present. This appliance is not to be used in areas where the atmosphere could cause fire.

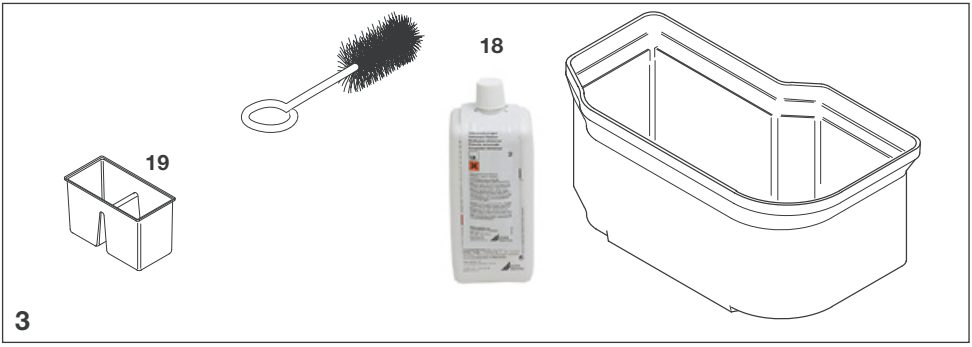
3.2 Electrical safety instructions

- The appliance may only be connected to an earthed safety socket.
- Before connecting to the electricity supply the appliance must be inspected and checked that the supply voltage and the supply frequency correspond to that of the local electrical supply.
- Before initial use and start-up the appliance and all supply lines must be checked for any signs of damage. Damaged supply lines and connections must be replaced immediately.
- Never come into contact with patients and open plug-in connections on the appliance at the same time.
- When using the appliance observe all the relevant electrical safety procedures.

EN







4. Delivery Contents

Model 1307-01 (230 V, 50 Hz)
Periomat Plus **with** daylight top, and heating

or

Model 1308-01 (230 V, 50 Hz)
Periomat Plus **without** daylight top,
with heating

1 Daylight top,
only model 1307-01 1304-700-00
2 Waste container 1303-000-06
3 Protective cover 1307-981-00
4 Cover for loading slot 1303-000-05
5 Film transport 1307-300-00
6 Water tank 1307-007-00
7 Fixer tank 1303-000-09
8 Developer tank 1303-000-08
9 Appliance base 1303-000-06
10 Periomat Intra,
X-ray chemicals CXB200C9940
11 Adapter for films,
11a 2 x 3.5 cm (3x) 1303-000-01
11b 2,4 x 4 cm (3x) 1303-000-18
11c 5,7 x 7,6 cm (1x) 1303-000-22
11d 4 x 5 and 2,7 x 5,4 cm
(je1x) 1303-000-02
12 Film collector 1303-001-00
13 Drip pan 1303-000-13
14 Sponges grey (2 x) 1303-000-06
Sponge red (1 x) 1303-000-05
15 Light protection hood for
loading slot 1303-000-14
16 Filling flange 1307-001-00
17 Waste water drainage hose . . . 1307-000-07
- Operating Instructions . . . . . 9000-600-11/..

4.1 Special accessories

The parts listed as special accessories are not part of the standard scope of delivery but can be ordered separately.

18 Perioclean-Set
for film transport cleaning 1304-070-00
19 Container, double tray 1303-000-16

4.2 Disposable materials

10 Periomat Intra,
X-ray chemicals CXB200C9940
20 Periomat Intra/C,
X-ray chemicals CXB210C9940
21 Universal Cleaner,
Double pack CCB600C5540
22 WR 2000 Spray cleaner,
Six pack. CCB800C5540

4

EN

EN

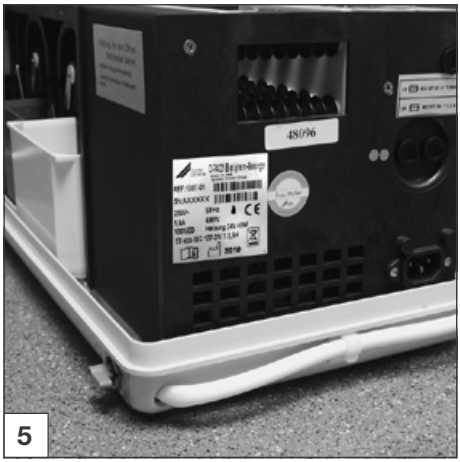
5. Technical Data

5.1 Model Overview

Model 1307-01 (230 V, 50 Hz)
Periomat Plus **with** daylight top, and heating

Model 1308-01 (230 V, 50 Hz)
Periomat Plus **without** daylight top, with heating

Model		1307-01 / 1308-01
Voltage	V	230
Frequency	Hz	50
Rated current	A	2,2
Rated power	W	500
Duty cycle	%ED	100
Film processing time	min	5
Developing temperature	°C	25
Warm-up time	min / °C	~7
Heating	V	24
Appliance fuse	A	T 2.5
Volume		
D eveloper-tank	l	1
Fixer tank	l	1
Water tank	l	1,25
Weight	kg	11,2 / 10,2
Dimensions (HxBxT)	cm	40 x 63 x 25 (1307-01) 22 x 63 x 25 (1308-01)



5

6

5.2 Model identification plate

The model identification plate can be found on the rear side of the appliance under the protective cover.

REF Order no.. / Model no..

SN Serial no.

5.3 Ambient conditions

Ambient conditions for storage and transport

Temperature (°C). . . . . -10 up to +60

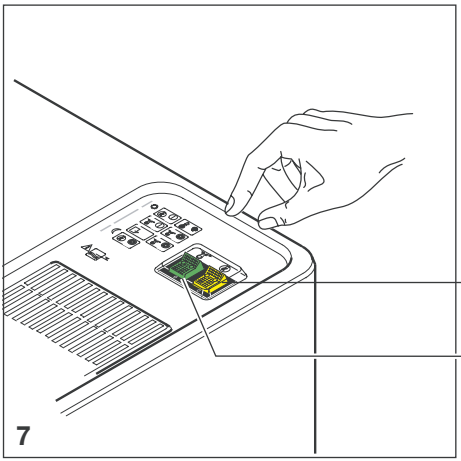
Rel. humidity (%). . . . . .max. 95

Ambient conditions on operation

Temperature (°C). . . . . +10 up to +40

Rel. humidity (%). . . . . .max. 70

EN



7

6. Switch panel functions

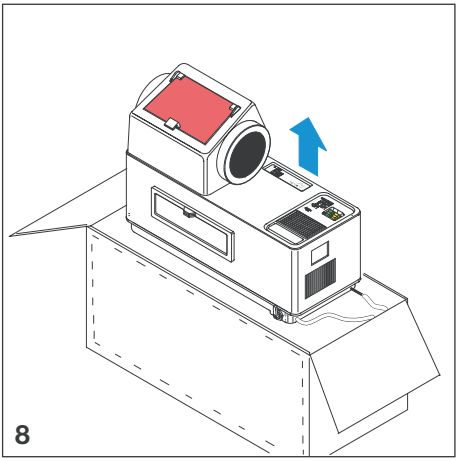
The yellow and green switches are fitted with an integrated control lamp.

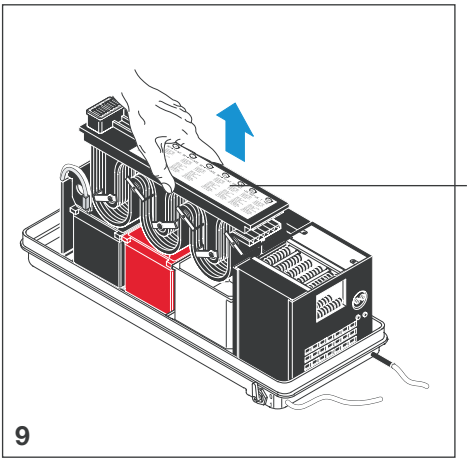
Yellow main power supply (23)

Pos. O: Periomat Plus **OFF**
Pos. I: Periomat Plus **ON**

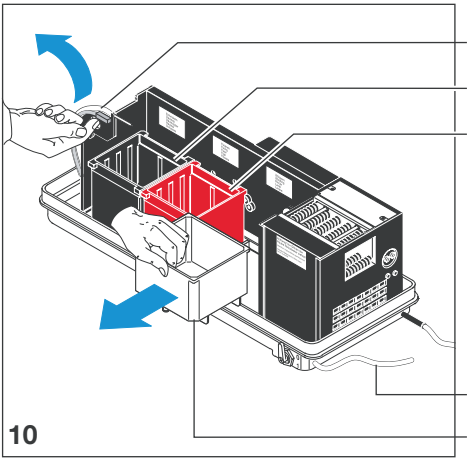
Green transport schwitch (24)

Pos. O: Transport motor **OFF**
Pos. I: Transport motor **ON**,
Developer process starts up


8



9



10

Mounting

7. Set-up

7.1 Room for Set-up

Max. Ambient temperature 25 °C.
Never use the Periomat in a position with direct sunlight!
The film material may become exposed despite the use of the daylight top.

- Set up the Periomat in a dry, well ventilated room.
- The mains supply socket should be so laid out that the main appliance plug is clearly visible, and is easily accessible.

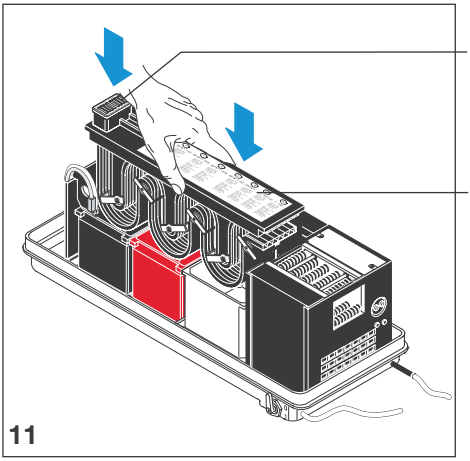
7.2 Set-up

- Take the Periomat out of its carton.
- Set the appliance up on a stable and horizontal surface in the vicinity of a mains supply socket.

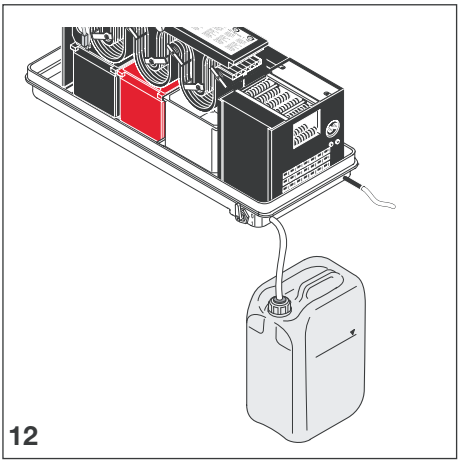
8. Start-up

8.1 Prepare the appliance

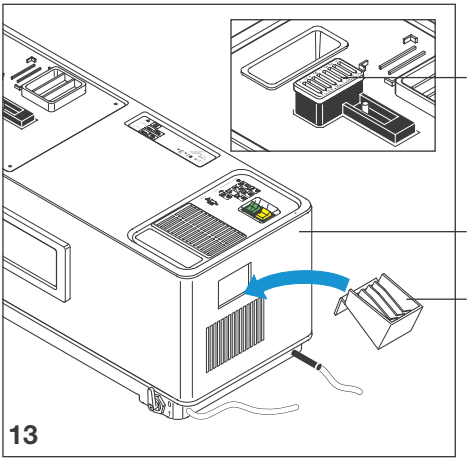
- Remove the protective cover.
- Remove the box containing the adapter.
- Remove the water bottle and the flexible pouring container.
- Remove the transportation safety padding material (foam rubber and cardboard in dryer compartments)!
- Remove the sponges from the tanks.
- Swivel the temperature controller (25) upwards.
- Remove the film transport (5), developer tank (8), fixer tank (7) and water tank (6), and remove any traces of packing material.
- Attach the water drainage hose (17)



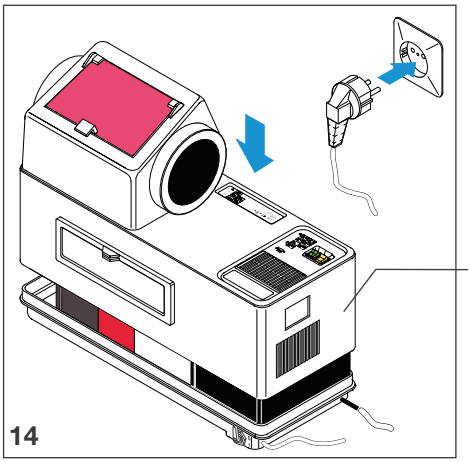
- Replace the parts in position.

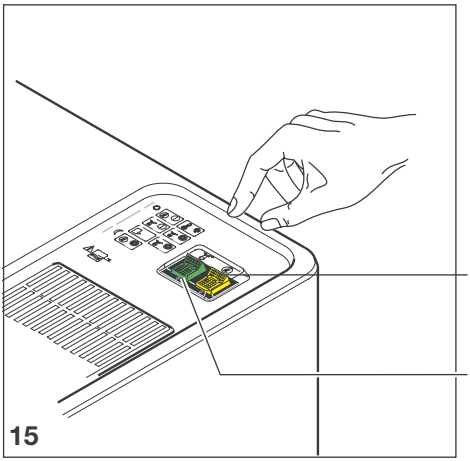


- Place an empty collector vessel with a capacity of at least 5 liters at the ready.
- Place this collector on the floor.
- Feed the water drainage hose into this container.
- Shorten the water drainage hose so that it hangs into the container about 3 cm.
- Mix up the chemicals, see section 10.



- Place the protective cover (3) in position.
- Place the cover (4) onto the loading slot (slot 8 must face to the front).
- Hang the film collector (12) in position.





- Check that the local supply voltage of the mains supply socket is identical to the voltage information on the model identification plate of the appliance.

CAREFUL
Danger of a short circuit due to condensated water coming into contact with the electronic circuit board!
- Only connect and operate the appliance after allowing it to warm up to room temperature after transport.

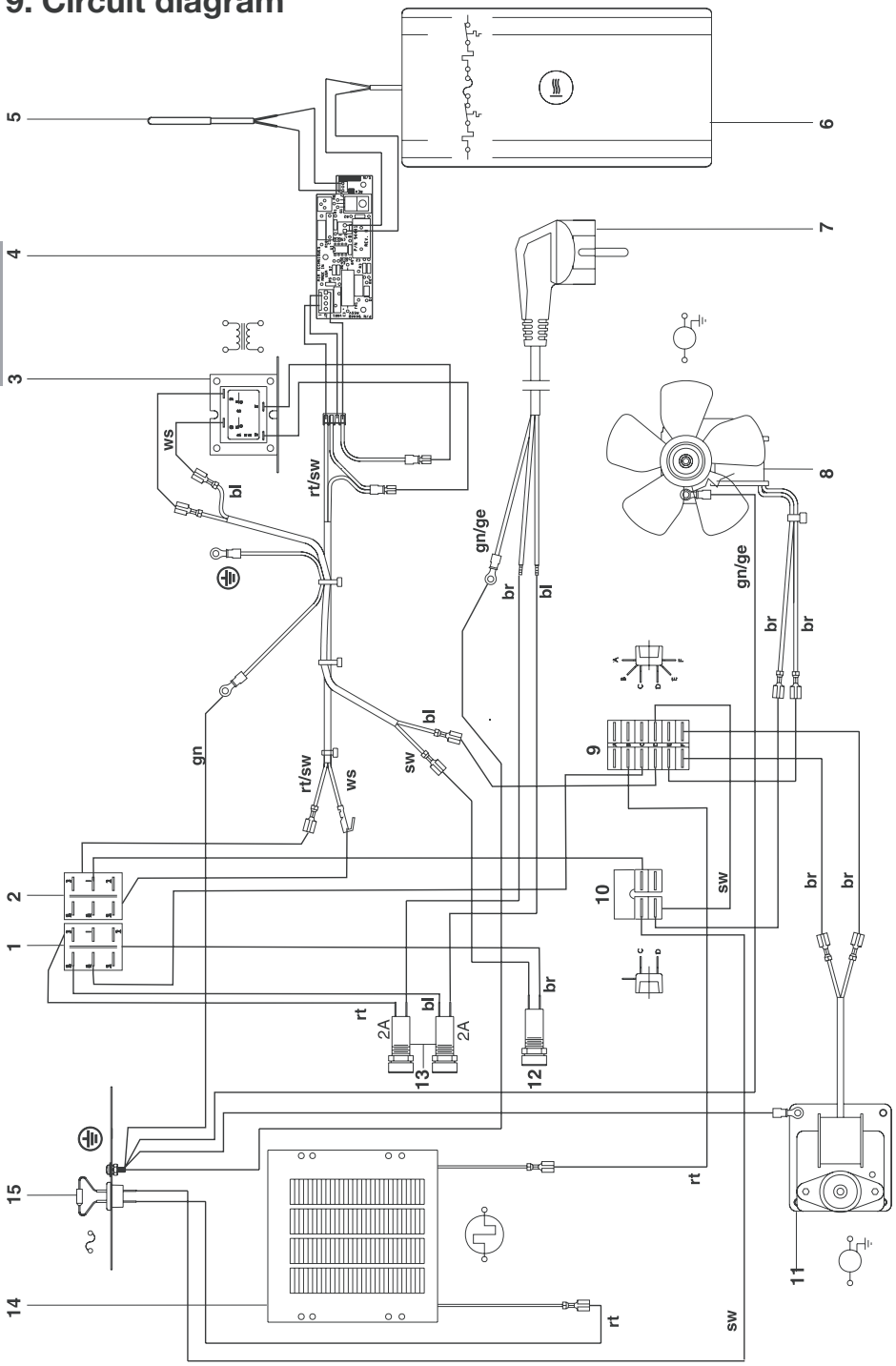
- Plug in at the mains.
- Switch on the appliance at the yellow switch (23).

The developer and fixer tanks are located on a temperature regulated heating plate.
If the temperature level when filling is lower than 25 °C then, after switching on at the yellow main power switch, the chemicals will automatically be heated up and kept to a constant temperature.

Example:
Warm up time per °C is ca. 7 min.
The optimum developer temperature is 25 °C.
Assuming an initial temperature of 18 °C, the warm up time will be approximately ca. 45 min., until the ideal developer temperature has been reached.

The green transport switch (24) lights as soon as the set developer temperature of 25 °C has been reached.

9. Circuit diagram

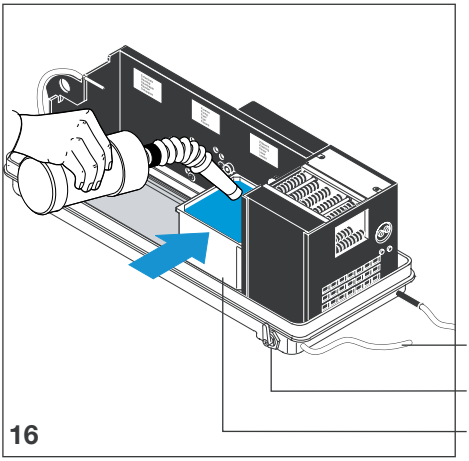


9.1 Descriptions

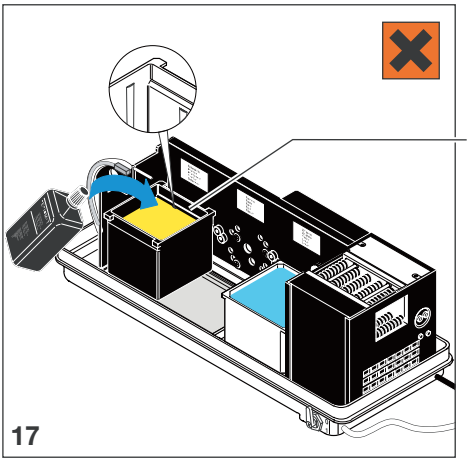
1 Green transport switch
2 Yellow main power supply
3 Transformer unit
4 Electronics
5 Temperature sensing device
6 Bath heating
7 Plug
8 Ventilation fan for film drying
9 Transport motor
10 Heating for film drying
11 Thermal fuse
12 Fuse power supply
13 Fuse controller
14 Distributor 1
15 Distributor 2
16 Distributor power supply

9.2 Connection colours

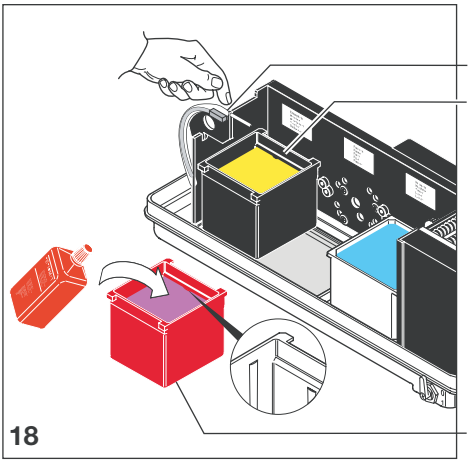
gn/ge = green/yellow
rt/sw = red/black
ws/or = white/orange
sw = black
rt = red
br = brown
bl = blue
or = orange
gn = green



16



17



18

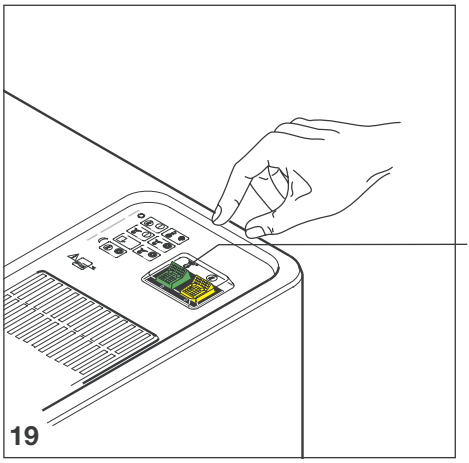
Use

10. Chemical preparation

In order to produce perfect developer results we recommend you use the specially designed Dürr Periomat Intra Chemicals.

ATTENTION
Danger of inadvertant mixing of chemicals!
Poor quality of developed film.
- After filling with the chemicals, do not move the Periomat.

- Switch off the appliance at the yellow main power switch.
- Unplug at the mains and remove all power.
- Remove the protective cover.
- Close the water drainage valve (26).
- Fill the water bottle with **max. 25 °C warm water** to the marking (1.25 l).
- Pour all the contents of the water bottle into the water tank (6).
- Place the black developer tank in position (8).
- Fill developer (black bottle) into the black developer tank (8).
- Swivel the temperature controller (25) downwards.
- Fill fixer (red bottle) into the red fixer tank (7) and place tank in position.
- Pour warm water at max. 25 °C into the red fixer tank (7) and into the black developer tank (8) to the lower markings.
- Stir the developer and fixer well.
  This serves to avoid differences in quality of the film development results.
- Place the film transport (5) carefully into position. Be careful to avoid any splashing or spilling of chemicals.



19

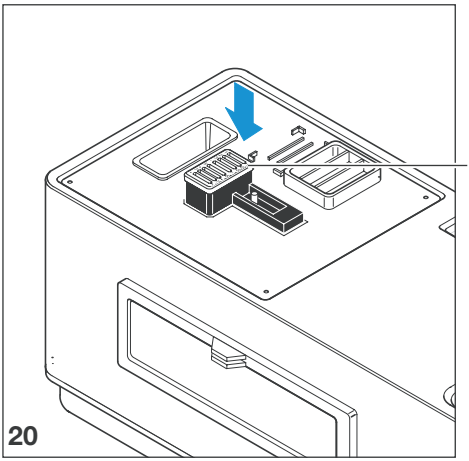
11. Instructions for use

Films of format 3 x 4 cm are placed into the loading slot without adapter, see 11.1.
Films of larger formats are first placed in the appropriate adapter before insertion in the loading slot, see 11.2.

11.1 Film insertion without adapter

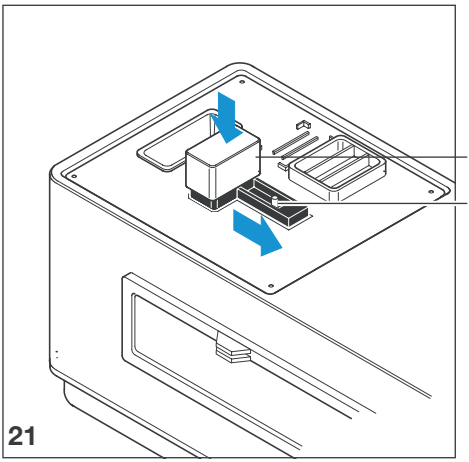
- Switch on the appliance at the green transport switch (24).

EN



20

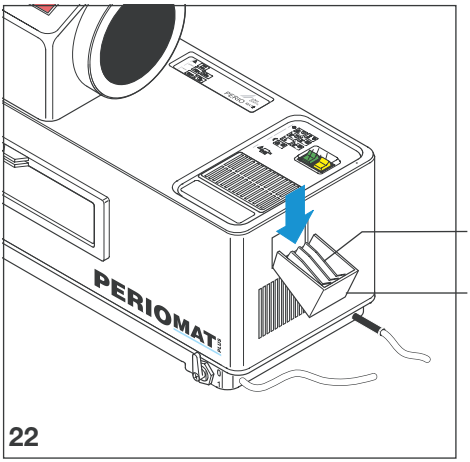
- Insert 3 x 4 cm films in the numbered cover (4) of the 8-slot loading slot. **Only insert one film into each slot.**



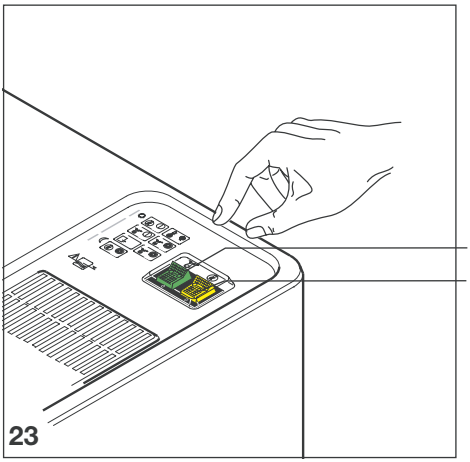
21

- Place the light protective cover (15) in position.
- Slide the start lever (27) to the right.

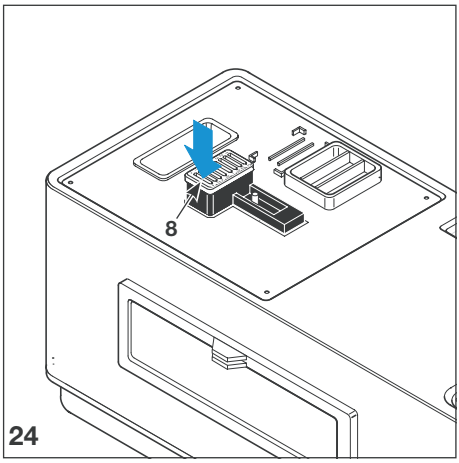
A new film can only be inserted once the start lever (27) is back in its starting position (after ca. 50 seconds).



- After film development the 3 x 4 cm films fall into the film collector (12) between the guiding ridges (28).



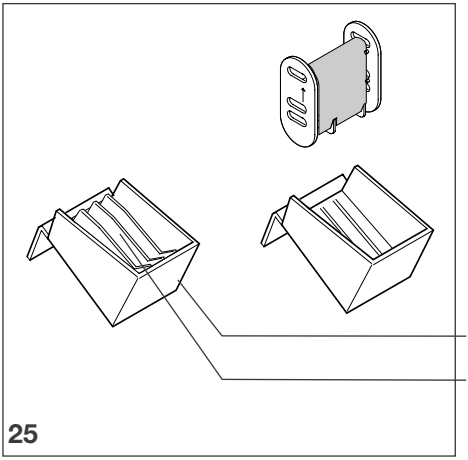
- Once the films are in the film collector, switch off at the green transport switch (24).
- At the end of surgery hours or before a longer break, e.g. midday break, switch the appliance off at the yellow main power switch (23).



11.1.1 Speedy developing for root canal treatment

- When carrying out root canal treatment place the film in the first slot, 8.
- After ca. 2:30 min. switch off the appliance at the yellow power supply switch (23).
- Open the front flap and using a suitable instrument, e.g. a pair of tweezers, remove the film carefully from film slot 8.

These films cannot be archived as they have not completed the full cycle including water treatment.
In order that the exposure can be added to the archives it is necessary that the film material goes through a complete film development cycle again.



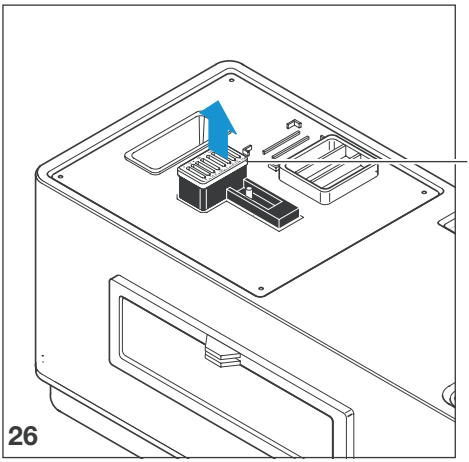
25

11.2 Film insertion with adapter

When working with the adapter the guiding ridges in the film collector must first be removed.

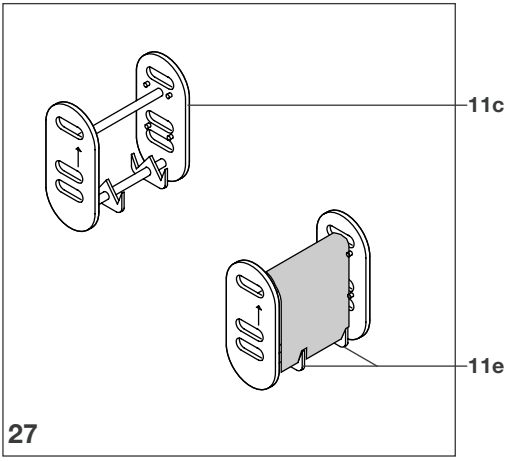
When frequent switching between films **with** and **without** adapter is encountered, we recommend that a second film collector (12) is ordered. (Order no. 1303-001-00)

- Extract the guiding ridge (28) from the film collector (12).



26

- Remove the cover (4) to the loading slot.

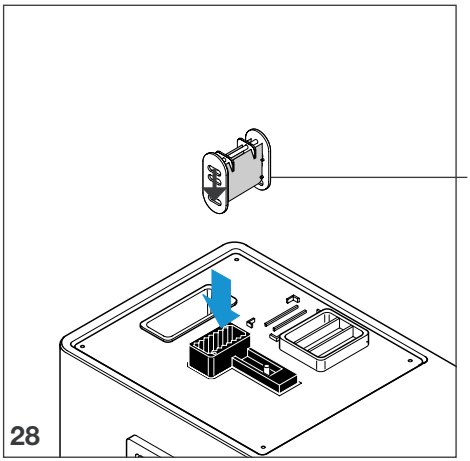


27

- Insert film(s) in appropriate adapter:

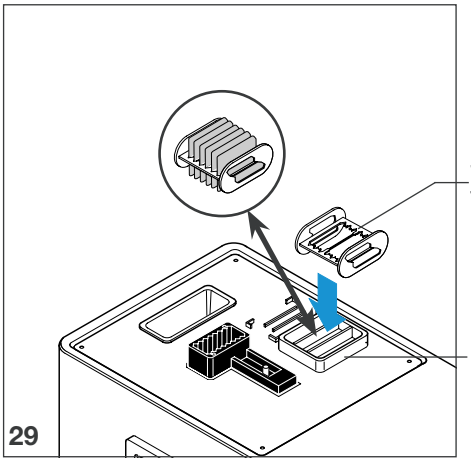
11.2.1 Occlusal-Film (5.7 x 7.6 cm)

- Very carefully bend the occlusal-film along the centre and place in the appropriate adapter (11c).
- Check that the film is secure in its mounting (11e).



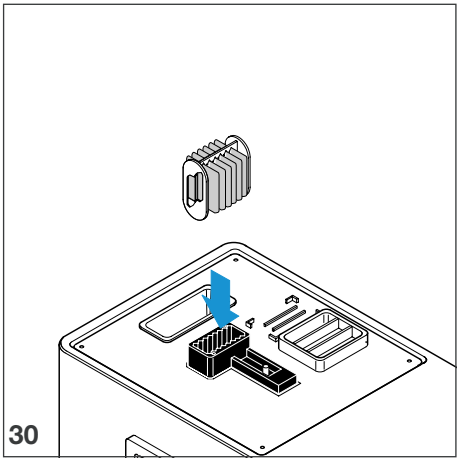
- Place the adapter (11), arrow downwards, into the loading slot.

ATTENTION
Danger of inadvertant mixing of chemicals!
If the adapter is falsely inserted (not with arrow pointing down) then film developer and fixer will be carried over.
Poor quality of developed film.
- Check carefully that the arrow on the adapter points downwards.

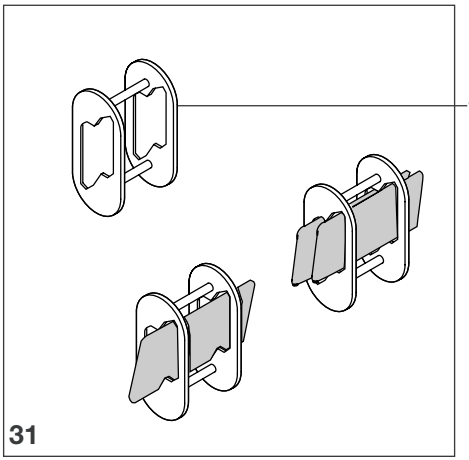


11.2.2 Film at 2 x 3.5 cm and 2.4 x 4 cm

- Place adapter (11a) or (11b) in mounting (29).
- Press each film individually (max. 6 films) into the slot of the adapter until thez make contact with the mounting.
  The films must stay parallel to each other and must not be allowed to make contact with each other.

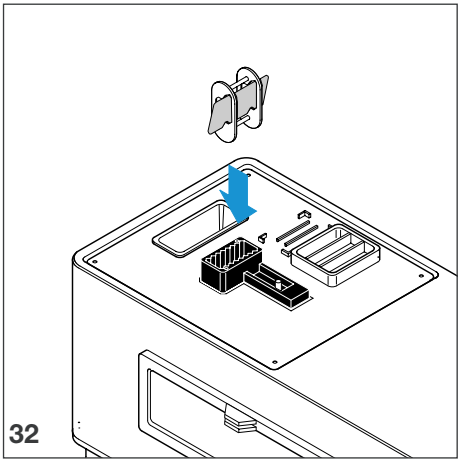


- Place the adapter vertically into the loading slot.

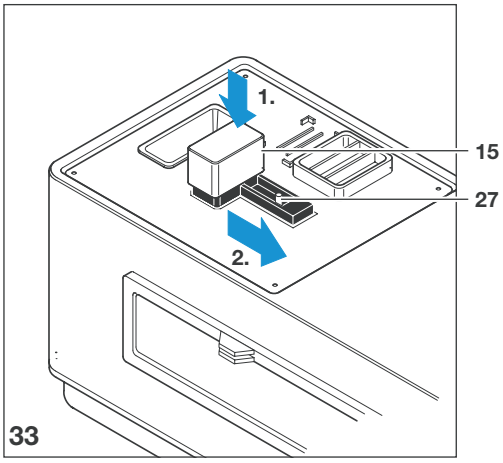


11.2.3 Film at 4 x 5 cm and 2.7 x 5,4 cm

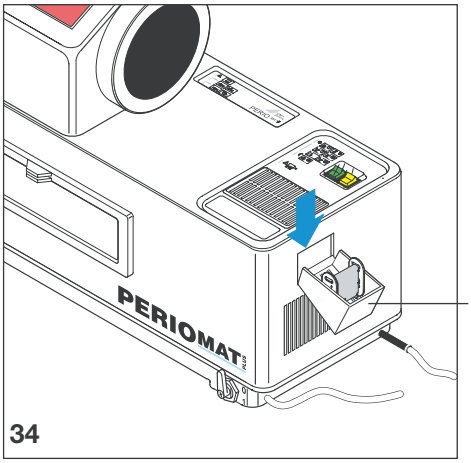
- Place the films (max. 2 films) into the adapter (11d).



- Place the adapter vertically into the loading slot. The film edges must no be allowed to touch the shaft sides.

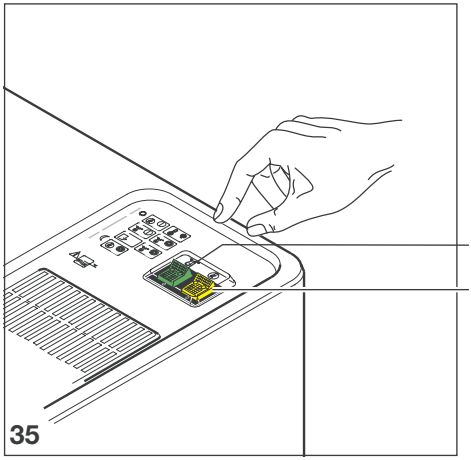


- Place the light protective cover (15) in position.
- Slide the start lever (27) to the right.



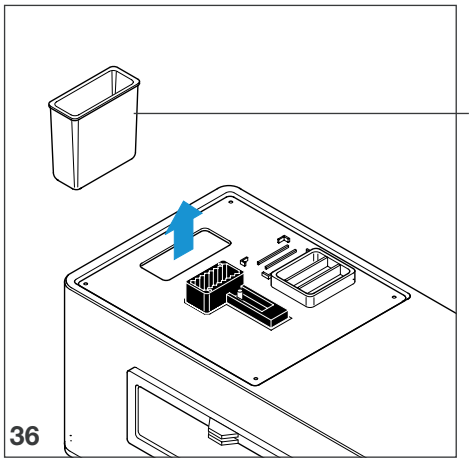
34

After the films have been developed they fall with the adapter into the film collector (12).



35

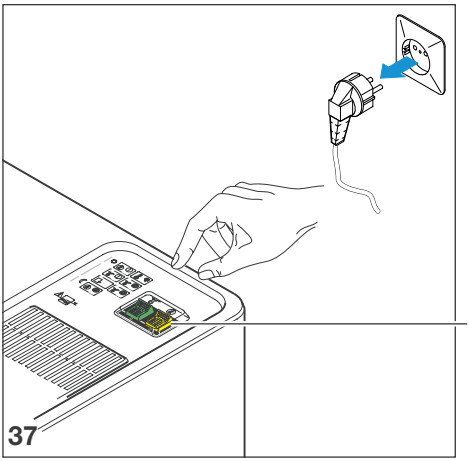
- After film development switch off the film transport at the green transport switch (24).
- At the end of surgery hours or before a longer break, e.g. midday break, switch the appliance off at the yellow main power switch (23).



36

11.3 Miscellaneous

A waste container (3) has been integrated which can be lifted out and has been designed for the film packing material.

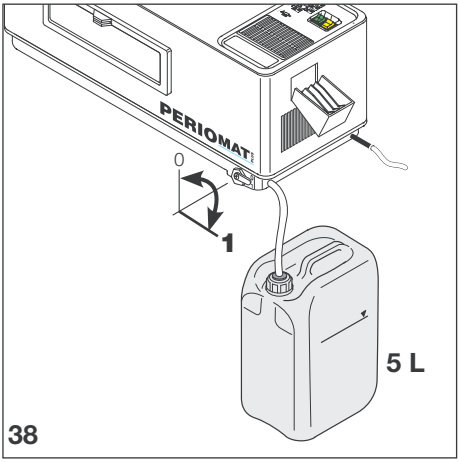


12. Maintenance

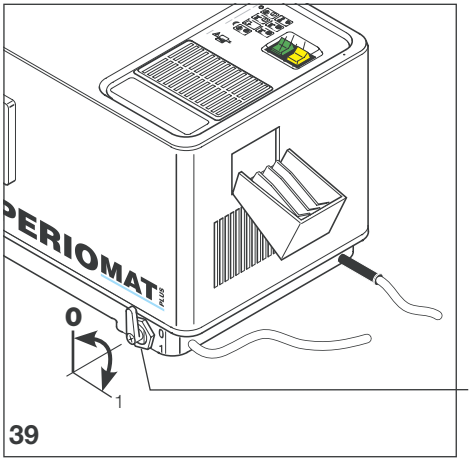
12.1 Weekly 2 x water change and check level of chemicals.

- Switch off the appliance at the yellow switch (23).

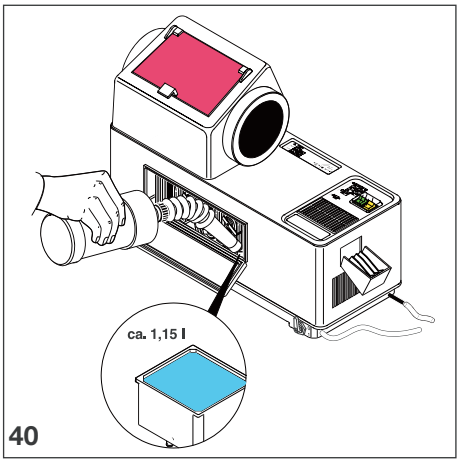
Unplug at the mains and remove all power.



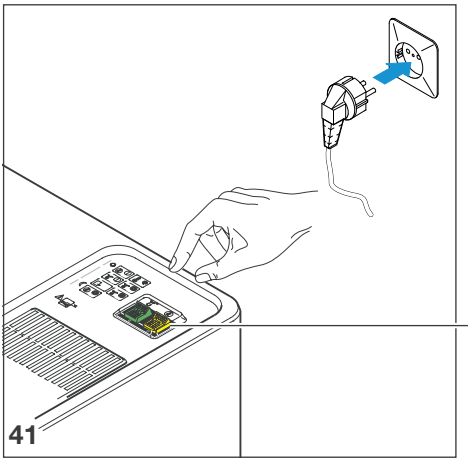
- Check whether an empty 5-liter-collector vessel has been connected.
- Open the water drainage tap (26) so that water can drain off into the collector vessel.



- Close the water drainage tap (26), position "0"
- Dispose of the waste water according to local regulations.



40

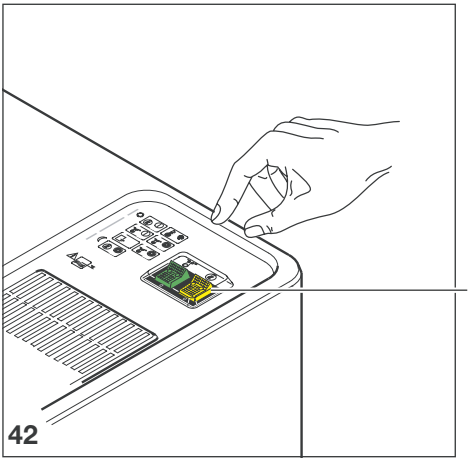


41

- Fill the water bottle with **max. 25 °C warm water** to the marking (l).
- Open the front flap.
- Pour the complete contents of the water bottle into the water tank.
- Check the level of the chemicals in the developer and fixer tanks.
- Top up any liquid loss by adding water at **max. 25 °C** to the markings (see inside of flap).

Film quality
The developer and fixer temperatures are set at 25 °C.
If water warmer than 25 °C is added, this will lead to films being darker.

- Close flap.
- Plug in at the mains.
- Switch on the appliance at the yellow switch (23).

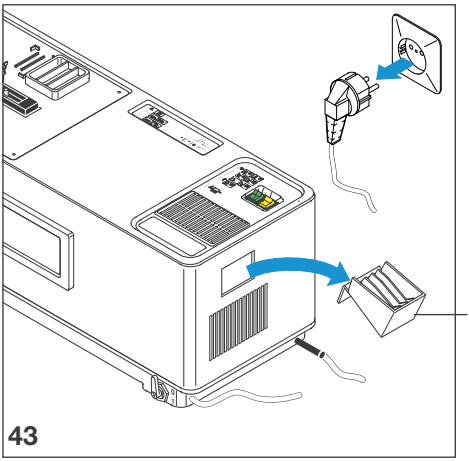


12.2 Every 3 weeks change chemicals

After ca. 3 weeks or after developing approximately 350 films of 3 x 4 cm format the developer and fixer are used up and need to be replaced.

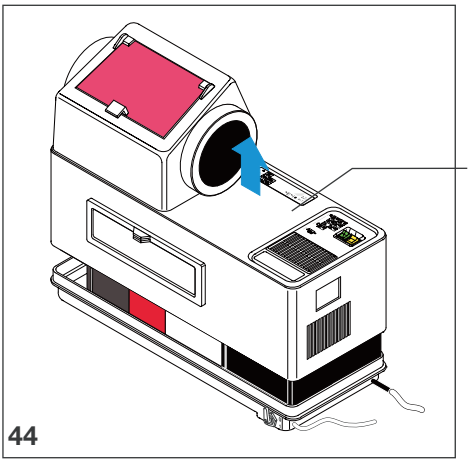
- Before cleaning place the sponge and brushes (from Perioclean-Set) ready.
- Switch off the appliance at the yellow switch (23).

EN

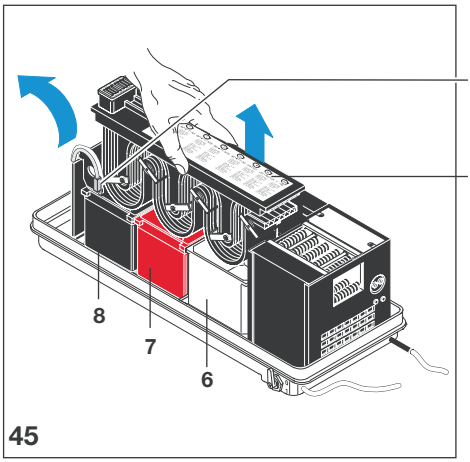


Unplug at the mains and remove all power.

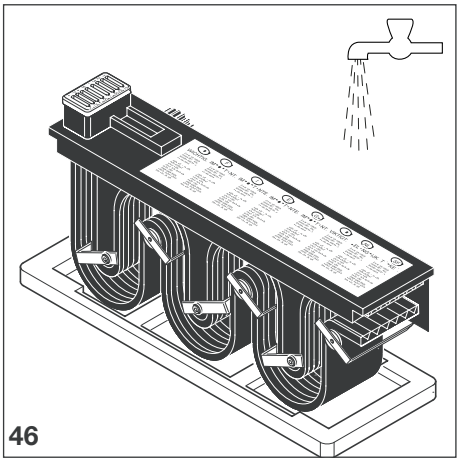
- Remove the film collector (12).



- Remove the protective cover (3).



45


46

47

- Lift the film transport (5) slightly and allow the chemicals to drain off.
- Place the film transport in a suitable area, e.g. washbasin or sink, spray with Spray Cleaner WR 2000 and allow to work for ca. 10 min.
- Swivel the temperature controller (25) upwards.
- Empty both chemicals and water.
- Observe any local or national rules and regulations concerning disposal of x-ray chemicals.
- Clean all 3 tanks (6, 7, 8) using the correct colour coded sponge thoroughly with **warm water** and wipe clean.
- Dry the area surrounding the loading slot with a non-fluffy cloth.
- Remove any possible remaining deposits or dirt from the film transport using a brush (e. g. from the Perioclean-Set).
- Rinse the film transport (5) thoroughly under warm running water.
- Place the film transport onto a draining board (fig. 46).
- Make up chemicals, see 10. Chemical preparation.

12.3 Every 6 months clean the film transport

Only when using "Periomat Intra" X-ray chemicals

When cleaning the film transport, we recommend you use the Dürr Dental Perioclean-Set, order number: 1304-070-00.
Detailed instructions for use are supplied with each set.

DÜRR DENTAL AG
Höpfigheimer Strasse 17
74321 Bietigheim-Bissingen
Germany
Fon: +49 7142 705-0
www.duerr.de
info@duerr.de

DÜRR DENTAL